AVICULTURAL MAGAZINE

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Black-headed Shrike on Bougainvillaea.

Frontispiece

AVICULTURAL MAGAZINE

THE JOURNAL OF THE AVICULTURAL SOCIETY
AND THE AVICULTURAL SOCIETY OF AMERICA

Vol. 66.—No. 2.—*All rights reserved.* **MARCH-APRIL, 1960**

THE BLACK-HEADED SHRIKE

(*Lanius nigriceps*)

By the Rev. B. C. R. HENRY (Orissa, India)

This is one of the commonest birds in the hills of Orissa, India, where I live. Even since starting to type this manuscript I have heard one calling near by. Our garden has several bougainvillaea bushes which are a favourite haunt of these birds and for this reason I have depicted bougainvillaea in the illustration. There are few parts of the day, at any time of year, when Black-headed Shrikes cannot be heard or seen in this area, for they are resident here.

The notes are harsh and scolding, typical of shrikes in general. I have, however, often heard them cleverly mimicking the calls of other birds ; but their efforts at song are hardly successful, though not for want of trying. With expert songsters like Magpie-Robins and Purple Sunbirds to compete with in the garden, shrikes really stand little chance !

Perhaps an attractive feature of bougainvillaea shrubs from the shrike's point of view is that they contain ample large thorns on which the birds can impale beetles, grasshoppers, frogs, small lizards, mice, and other prey. A lovely thick bush in the garden, gorgeously decked with magenta blossom, may quite likely be the den and the larder of an inveterate murderer, the Black-headed Shrike—a relentless enemy of living creatures smaller than itself. Yet let us not be too severe on the little bird, for in this very respect it is the gardener's friend, keeping down pests that ruin his crops.

The Black-headed Shrike likes open, wooded country, avoiding thick jungle. It usually sits in a prominent spot on the top of a bush or on a protruding branch, watching for prey or noisily uttering squeaks and squawks. As soon as a victim is spotted the bird pounces on it, carrying it back to the bush to be eaten immediately or to be stored on some thorn in the butchery.

The distinctive white breast and black head can be seen from

two or three hundred yards' distance, but the more delicate hues of grey on the upper back, and rufous underparts and rump, are only visible at close range. Male and female are alike.

Flight is steady but not sustained for long. The birds are content to keep within their " beat ", on the whole, and never fly high.

Black-headed Shrikes live alone for most of the year, only pairing off at the nesting season from April to July. Nests are neatly constructed of grass and feathers in the fork of a branch. Up to six eggs are laid. These vary in shade from pale cream to stone colour or greenish-white, blotched and speckled with brown. The young look much like other shrikes, having the typical black streak past the eye and ear, but soon after they commence independent life the distinctive black head and white breast begin to appear.

As noted above, Black-headed Shrikes are resident in Orissa and possibly also in certain other parts of north-eastern India ; but those birds which inhabit the foothills of the eastern Himalayas migrate to the plains of north-eastern India and Assam during winter.

* * *

COLOUR FEEDING OF FLAMINGOS

By Holger Poulsen

(Curator of Birds, Copenhagen Zoo, Denmark)

For many years aviculturists and zoo people have tried to keep the bright colour of the feathers in red birds. In some cases feeding with different colour agents has worked successfully, and further biochemical findings on bird pigments in recent years have been of great importance in the problem of retaining the right colours in captive birds.

Most of the yellow, orange, and red pigments of the birds' skin and feathers are carotenoids, which are widespread among plants and animals. According to Völker (1958), it seems that all the reddish carotenoids occurring in birds are not synthesized by the birds. They have to be present in the food and are merely deposited in the birds' body either unchanged, or transformed by oxidization in the body from yellow carotenoids in the food.

In Crossbills (*Loxia curvirostra*), according to Völker (1954), the red and the yellow feather colours consist of a yellow and a red component. While the yellow is identical with the yellow carotenoid in plants, the red component is not identical with any of the red carotenoids found in plants. The bird changes the yellow carotenoid in its food to a red carotenoid in its body. This ability is not great in captive birds on account of a lower metabolism than in wild birds. But

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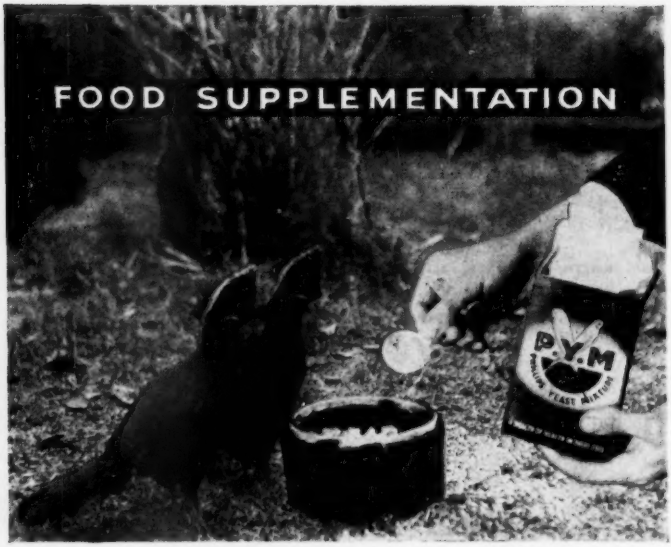

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Professor Völker (1957) was the first to succeed in inducing a red feather colour, instead of pale yellow in this species in captivity, by feeding it with rhodoxanthin from yew-berries, which, however, is not a natural part of the food of this bird.

The flamingos with their pink and red colour are attractive birds for every zoo. But, unfortunately, the colour fades, and the carotenoids disappear from the feathers. Already many years ago, it was realized that this was due to the unnatural diet of flamingos in captivity. In many zoos attempts have been made to re-establish the red colour of the flamingos. But it has proved to be quite a problem to find the right carotenoid source and supply it in adequate amounts. Many different substances were used with more or less effect, but in recent years many zoos are meeting this problem with greater success than before. Substances which are used are ground carrots, carrot juice, grated fresh beets, Scottish sea-weed meal (*Fucus*), ground shells of lobsters and shrimps, etc.

It is commonly believed that the pink and red colours of flamingos are caused by a reddish carotenoid, which is probably identical with, or closely related to, astaxanthin, the red pigment of prawns and lobsters. Recently Professor Völker (1958) has found that the red feather colour of flamingos and the Scarlet Ibis (*Eudocimus ruber*) is a specific red carotenoid and not identical with astaxanthin.

The flamingos feed in shallow water near the shore, and they frequently paddle with their feet, but they also wade along breast deep. They eat the minute animal and vegetable life contained in the water and mud of lake and lagoon bottom, by a sort of filter feeding. Their food consists of worms, crustaceans (copepods, branchipods), chironomid and mosquito larvae, molluscs, and further algae and other vegetable items (Allen, 1956). It is known that many of the small crustaceans the flamingos feed upon are red, but the colour is due to the haemoglobin, the colour of the blood, e.g. *Artemia salina*, Daphnia, and Tubifex (see Völker, 1958). Thus these food items cannot be carotenoid sources for the flamingos. It seems, therefore, that the red carotenoid in the feathers of wild flamingos is manufactured by the birds themselves from yellow vegetable carotenoids in their food just as with other species with red carotenoids in their feathers. At least there is no evidence that flamingos obtain the red carotenoid direct from the food and deposit it in their feathers according to Völker (1958).

The carotenoid sources used in the diets in zoos have a direct effect if the food mixture contains appreciable amounts of carotenoids. The carotenoid present in carrot juice is known to be assimilated by birds in very small amounts. But it is known that this carotenoid has an indirect effect as it favours the depositing of the carotenoid colours. On the other hand the flamingos according to the results from Bronx

Zoo where the curator of birds, W. G. Conway, uses a concentrated carrot product with great success, seem to be able to transform the yellow carotenoid from carrots to a red carotenoid (Conway, 1958, 1959).

Anthocyanin from beets has no effect as it is not a biochrome in birds (Fox, 1953).

The active part of the sea-weed meal, which is used in the Basel Zoo (Wackernagel, 1959), seems to be iodine as the carotenoid fucoxanthin which is present in fresh sea-weed is only to be found in small amounts, if any, in dried sea-weed meal. It is known that iodine stimulates metabolism and therefore indirectly may favour the deposition of carotenoids (Völker, 1958). Dried shrimps do not contain carotenoids and do not have any effect, according to Völker (loc. cit.).

Dr. D. L. Fox (1955), in corroboration with the Curator of Birds in the San Diego Zoo, Mr. K. C. Lint, has used another method of inducing the red feather colour in captive flamingos. He has made use of the grated carapace of the Californian lobster (*Palinurus ruber*) carrying the red carotenoid astaxanthin, and he has demonstrated that the feathers contained unchanged astaxanthin.

This is a similar case to that of Völker (1957), who succeeded in inducing the red feather colour in captive Crossbills by giving them the red carotenoid, rhodoxanthin. These two experiments show that it is possible for these birds to deposit red carotenoids in their feathers. But in wild birds the red colouring of the feathers must be a much more complicated process, and the red carotenoids mentioned are not found in the feathers of wild birds of the species in question.

Since the flamingos' feather colour is affected by their food, this means that we must supply special ingredients in their diet that will produce a normal feather colour, and must also meet the flamingos' nutritional requirements. But both biochemical findings and new feeding methods show that retaining of the red colour is not dependent on a particular carotenoid. Both red and yellow carotenoids may be used, provided that they are given in large quantities.

For the last three years in the Copenhagen Zoo, we have kept our twenty flamingos in excellent colour by feeding them ground sweet peppers (paprika containing the red capxanthin) added to their food mixture. This method has been used successfully for years by aviculturists in colour-feeding canaries. It is a very simple and cheap method of colour-feeding flamingos, and the feather-colour produced is practically the same as in wild flamingos, according to Professor Völker, who investigated and compared feathers of our flamingos with those of wild birds. Further, the red portions of the skin on the legs and the bill also retain the natural reddish colour.

We have three species of flamingos, viz. the Red or American Flamingo (*Phoenicopterus r. ruber*), the Chilean Flamingo (*Phoenicopterus*

r. chilensis), and the European or Greater Flamingo (*Phoenicopterus r. antiquorum*). In the wild state the first mentioned is the only really red one. The others are pink with red wings. We gave our birds, which were sadly pale—nearly white—a handful of ground capsicum—a commercial product—to a pail of the soupy food mixture a month before their moult began in July, and gradually red feathers appeared ; and when the flamingos had finished their moult they had their normal colour. The American Flamingos were deep vermilion and the other species pink. Since our flamingos got their bright colour they have been much more admired by the public.

A visible improvement in colour was also attained with a Scarlet Ibis (*Eudocimus ruber*) and a Scarlet Cock of the Rock (*Rupicola peruviana sanguinolenta*), and three Scarlet Tanagers (*Rhamphocelus brasilius*). The addition of the capsicum to their food produced a very marked deepening, although no full development, of the red colour of their plumage.

The capsicum seems to be a good carotenoid addition to the flamingo diet, as it has a favourable effect on the colour. Further the flamingos eat it readily, it is economical and easy to prepare, and effective in quite small quantities. From the zoo standpoint, this method works well ; but it is an artificial way of retaining the red feather colour in flamingos. Flamingos in the wild state use other carotenoids and this method does not bring our understanding of the feather colouring in wild flamingos any further.

Thus there now exist different successful methods of colour feeding flamingos, and pale flamingos should no longer be seen in zoos. It is necessary that the flamingos are given a carotenoid addition to their diet. Different kinds of carotenoids can be used as colouring agents, but they must be given in rather large amounts.

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THE TAXONOMIC RELATIONSHIPS OF BIRDS AS INDICATED BY THE EGG-WHITE PROTEINS: A REQUEST FOR HELP

By CHARLES G. SIBLEY (Prof. of Zoology, Dept. of Conservation, Cornell University, Ithaca, New York, U.S.A.)

The purpose of this brief article is to introduce some research in progress on the egg-white proteins of birds and to present a request for assistance in collecting material for study. Egg-white from both wild and captive birds is wanted and "clear", cracked, or deserted eggs, which otherwise would be discarded, will often yield excellent material. Instructions for collection and shipment are appended. Further details and references will be found in the April, 1960, issue of THE IBIS.

* * *

For more than sixty years it has been known that the proteins of each species of animal are specific to it and that the degree of similarity between the proteins of two species reflects their evolutionary relationships. This fact is the basis of immunization against disease and, as would be expected, much of the research pertaining to protein specificity has been in this connection.

Within the past few years it has been shown that protein molecules are actually chains of smaller molecules called amino acids. Furthermore, it is now certain that the sequence of the amino acid links in the protein chain is determined by genes. There are just twenty kinds of amino acids which are important in animal proteins and these are arranged in long, usually folded chains. Such protein chains may contain from a few to many hundreds of amino acid links and it is the sequence of the amino acids, just as it is the sequence of the letters in a sentence, that gives a protein its specific properties. For example, the hormone oxytocin, which causes birds to expel their eggs, is a short chain of only eight amino acids. The hormone insulin contains fifty-one links in two chains, the enzyme lysozyme, in avian egg-white, is a chain of 134 links, ovalbumin contains about 400, and ovoconalbumin about 800 amino acid links.

The recent discovery that the sequence of the links in the protein chain is genetically determined has made it apparent why protein characteristics reflect taxonomic relationships and has stimulated studies on the proteins of several animal groups including insects, crustacea, fish, reptiles, mammals, and birds. The source of the protein to be studied may be any tissue, such as muscle, blood, etc. The egg-white proteins of birds are truly ideal for this purpose for they are easily obtained in a pure state without the difficulties of extraction encountered when using other sources.

From the various pieces of evidence about protein structure it is clear that if we can measure some property of proteins which gives an index to the sequence of amino acids we automatically have obtained information about the genes that directed the formation of that sequence. There are several ways to do this. One is a method called " paper electrophoresis " which is an electro-chemical process widely used to-day as a method for sorting out the different kinds of proteins in a mixture of several. The process is used in the diagnosis of human disease, in industry and in research. In avian egg-white there are about a dozen different kinds of proteins and these vary from species to species in shape, size, and electric charge. To separate these various proteins, and thus to measure some of their properties, a small amount of egg-white is placed on a strip of filter paper in an electrophoretic cell and a gentle current is applied for 16 hours. The different proteins move through the filter paper at different rates of speed depending upon their characteristics. Since these result partly from the sequence of their amino acids the distance they travel is an index to their genetically determined properties. The proteins in the paper strip are then dyed and scanned with a photoelectric device that produces a many-peaked curve, each peak representing a protein. By comparing the curves of different species it is possible to detect genetic, and hence taxonomic, relationships.

Up to 1960 we have studied egg-white from more than 700 species of birds. These have come from many parts of the world and have been collected from both wild and captive birds. The results of a study of some 360 species of non-passerines will be published in the April, 1960, issue of THE IBIS under the title, " The Electrophoretic Patterns of Avian Egg-white Proteins as Taxonomic Characters." In brief, some of the results are as follows :—

1. The flamingos are related to the herons and storks, not to the waterfowl as has been suggested by studies on the feather lice.

2. The gallinaceous birds are a very closely-knit group, as was evident from the numerous hybrids among them. From a consideration of all the evidence, including the egg-white proteins, it is proposed that the Galliformes be classified as follows :—

Family MEGAPODIIDAE—Megapodes
Family PHASIANIDAE—Pheasants, etc.
  Subfamily PHASIANINAE—Typical pheasants, francolins, partridges, etc.
  Subfamily MELEAGRIDINAE—Turkeys
  Subfamily NUMIDINAE—Guineafowl
  Subfamily TETRAONINAE—Grouse
  Subfamily CRACINAE—Guans, Curassows
Family OPISTHOCOMIDAE—Hoatzin

3. The Anatidae are also a very closely-knit group as, again, the many hybrids testified. *Anseranas* has a distinctive egg-white profile and may be separated as a tribe or subfamily.

4. The falcons are not closely related to the other diurnal birds of prey and possibly should be placed in a separate order.

5. The turacos (Musophagidae) are related to the cuckoos via *Centropus*, not to the gallinaceous birds as the feather lice suggested.

6. Bee-eaters, motmots, and kingfishers are related to one another but seem not to be closely related to the rollers. The first three groups should be included in the same order, but the rollers should be placed in a different order. Other members of the "Coraciiformes" have not yet been studied.

7. The pigeon genus *Columba* is apparently made up of two groups of unrelated species, an Old World group and a New World group. The New World species are probably related more closely to such genera as *Zenaida* and *Streptopelia* than to the typical Old World species of true *Columba*.

Additional examples could be given but it is important to stress that, in most instances, the egg-white protein evidence shows that the present classifications of Stresemann, Wetmore, and Mayr and Amadon are basically correct. However, the egg-white studies have been able to resolve certain problems and to indicate relationships among the orders and families of birds. As additional material is obtained and studied it should be possible to suggest further refinements in classification and to discover previously undetected phylogenetic relationships.

The present collection of some 3,000 frozen egg-white samples is maintained as a catalogued museum collection and is available for further study. In the next few years progress in the fundamental aspects of protein chemistry will surely be rapid and as new techniques to detect the genetically determined characteristics of proteins become available they will be applied to the study of avian evolution and systematics. Many gaps remain in the collection and it is here that the help of interested aviculturists and ornithologists is needed. The following instructions are presented with the hope that readers having access to egg-white specimens will collect and send them to the writer for study.

1. Fresh, unincubated eggs yield the best material but any egg from which egg-white can be obtained free of yolk and blood will provide useable material.

2. A small, sharp-pointed scissors, some clean, dry medicine droppers (pipettes), and a supply of clean glass or plastic containers of about $\frac{1}{2}$ oz. (15 c.c.) capacity will be needed. Corks or screw caps should fit tightly. The size is not important, any container of more

than 5 c.c. will do. For single, small eggs even smaller ones are suitable. (Pipettes and labelled containers will be sent upon request.)

3. Support the egg with cotton or paper in a teacup. With the scissors snip off a cap of shell from the small end of the egg. If the shell is to be saved drill the usual hole and collect the egg-white while blowing.

4. If the egg seems fresh, and the white is free of yolk and blood, take up the white with a medicine dropper and fill a container to within about ¼ inch of the top. Leave space for expansion if frozen. Cap or seal tightly.

5. Samples from the same clutch may be placed in the same container. (Beware of cuckoos and cowbirds !) Use a clean medicine dropper for each container or for each clutch.

6. Please label the sample giving the species, date, locality, your name, state of incubation of the egg, and other pertinent information.

7. Flush pipettes with *cold* water after using and allow them to soak for an hour or more to dissolve adhering egg-white. Dry them before using again.

8. If possible, keep specimens cold until they are mailed. However, egg-white will keep remarkably well for up to several weeks at 70° F. so lack of refrigeration does not preclude successful collecting of samples in the field. The material keeps better in a container than it does in the egg.

9. Never attempt to send whole eggs. Even though the shell may not break the yolk membrane usually ruptures and the mixing of yolk with the white usually ruins the specimen.

10. Pack in a crushproof box or tin. Do not send glass vials in an envelope or without good protection. Ship by AIR MAIL unless the time in transit will be less than a week. (Postage costs will be refunded upon request.)

11. Address the package to : DEPARTMENT OF CONSERVATION, CORNELL UNIVERSITY, ITHACA, NEW YORK, U.S.A. Att'n : Dr. C. G. Sibley. CONTENTS : SAMPLES OF EGG-WHITE FOR RESEARCH ONLY. PERISHABLE. RUSH.

All species are wanted, including duplicates of those already available. (The only ones of which we have an ample series are the Mallard, Ring-necked Pheasant, Common Guinea-fowl, Rock Dove, Ring-necked Dove, House Sparrow, and Starling.) Following is a list of the special desiderata : Penguins, Ostrich, Cassowaries, Rheas, Kiwis, Tinamous, Albatrosses, Diving Petrels, Petrels, Hammerhead, Shoe-bill, Flamingos, Screamers, unusual species of waterfowl, Birds of Prey, Megapodes, Guans, unusual species of pheasants, Guinea-fowl, Hoatzin, Mesites, *Turnix*, *Pedionomus*, Cranes, Rails, Finfoot, Kagu, Sun-bittern, Cariamas, Bustards, Jacanas, Painted-snipe, Crab-plover, Thick-knees, Pratincoles, Seed-snipe, Sheathbill,

Sandgrouse, Pigeons and Doves, Parrots, Turacos, Cuckoos, Owls, Nightjars, Swifts, Hummingbirds, Colies, Kingfishers, Todies, Motmots, Bee-eaters, Rollers, Cuckoo-rollers, Hoopoes, Wood Hoopoes, Hornbills, Jacamars, Puffbirds, Barbets, Honey-guides, Toucans, Woodpeckers, Wrynecks. All passerines are wanted but those from South America, Africa, Asia, and Australia are especially desirable because few species from these areas have been received. Of particular interest are Broadbills, Wood-hewers, Oven-birds, Ant-birds, Ant-pipits, Tapaculos, Cotingas, Manakins, Sharpbills, Plant-cutters, Pittas, Lyrebirds, Larks, Cuckoo-shrikes, Drongos, Orioles, Bell-magpies, Magpie-larks, Wattle-birds, Bower-birds, Birds of Paradise, Babblers, *Picathartes*, Bulbuls, Leafbirds, Dippers, Blue Thrushes, Cochoas, Fork-tails, Bush-shrikes, Helmet Shrikes, Vanga Shrikes, Wood Swallows, *Hypocolius*, Palm Chat, Silky Flycatchers, Flower-peckers, Honey-eaters, Sugar-birds, Pepper Shrikes, Shrike-vireos, Vireos, Troupials, Swallow-tanager, Tanagers, *Catamblyrhynchus*, Weaverbirds, and all Finches, Sparrows, and their allies.

Hybrids. The eggs laid by hybrid females of known parentage are of special interest in connection with studies on the inheritance of protein structure.

The above is an incomplete list and the omission of a particular group does not indicate that it is not wanted.

* * *

BREEDING OF THE ARARA (BLUE AND YELLOW MACAW)

By DORIS MCGREGOR (Rio de Janeiro, Brazil)

I was given a male Arara (*Canendé* or *Ara ararauna* according to my Brazilian bird book by Descourtilz) ; it was a great delight when it began coming on my finger and learning the names of most of us in the house. He was often amusingly heard to call " McGregor ! telephone ".

One day, many months afterwards, friends brought me another blue and yellow Arara—so dishevelled and in such a bad way that I wondered if I could save it.

I put the newcomer near, but not together, with my original Arara. The days turned to weeks and with a new lot of feathers " Pernambuco ", for so she was named before she came to me, began to show enthusiasm for her companion. For longer than I care to think, these two beautiful creatures lived on their bar devotedly attached to one another, until after a trip away, I returned to be told that " Pernambuco " had laid two eggs in my absence. I was thrilled and at the same time dismayed until about two months later she laid

two more. This time I hurriedly supplied a wooden box and put it in a recess at the side of their quarters to which she had easy access. The eggs were almost immediately smashed and the box chewed, the straw spilled everywhere. I was so disappointed, but there were yet another two eggs after another lapse of time. This time I put in false eggs, but the same devastation resulted. Later I went to England and before coming back to Brazil I went to the London Zoo to ask what sort of nest an Arara should have. I was shown this at close quarters (the property of a delightful cockatoo that followed me along the wire-covered railings saying invitingly " Hullo, have a drink ").

We returned to Brazil in September, 1958. It wasn't until 21st March, 1959, that, with the aid of a good carpenter, I had the Araras in a beautiful aviary of their own and removed their chains for ever and introduced them to a fine grandfather-clock type box, duly lined with chicken wire both inside and outside. There was no immediate reaction on the part of the Araras. However, on 2nd April, 1959, I was excited and happy to see the Araras go into the nest and from then on it seemed to me, as an onlooker, that they were very busy. After a while I noticed that the female Arara only came out in the early mornings. It was not until 5th July, 1959, that I noted in my diary that I fancied I heard the noise of a young bird issuing from the Arara's nest. I was convinced that a young Arara had been hatched because the male bird was now extremely busy—it would seem that he had them both to feed as much extra food was consumed and regurgitated. Then the female—in fact both—became so aggressive that it was quite impossible to go into the aviary in a friendly fashion any more.

Time passed and I began to think " Oh ! all this is wishful thinking ", and not being able to bear it any longer, I thought I would have a look. But the female seemed to divine my purpose ; she was in her nest like lightning with her head hanging out of the round entrance hole. She seemed to be anxiously defying me. I apologized to her and went my way.

It was unbelievably exciting, therefore, on the 12th September, 1959, to see a young Arara looking out of the entrance hole. It was fully feathered, but still being fed by the parents. On the 16th November, it ventured out entirely and one could see that the tail was not as long as the tails of the parent birds. It was a hopelessly gauche creature for days, clinging to the side of the aviary, getting slightly grubby under the chest. On the 27th, it had achieved making the high branch perch that its parents use and was trying to supplement what it got from them with attempts to take the bread and milk and honey, or banana nearest to it.

We feel that it is well named " Aranidade "—being a play on the name " Arara " and " ranidade " which means rarity.

I imagine it is a female as now (20th November, 1959), it is closely friendly with the male parent and almost ignored by " Pernambuco ", who, however, remains fiercely aggressive—a fact that I deplore, as most of my birds are so very tame.

" Aranidade " flaps its wings, to gain strength I take it, and I have even seen it fly to another part of the perch. It is also spotlessly clean once again.

The only difference between it and the adult birds is the colour of its eyes, which are a deeper blue, whereas the adults have a definite yellow rim.

* * *

NOTES ON SOME HUMMING BIRDS—AND THE NESTING OF THE DOCTOR, OR STREAMER-TAILED HUMMING BIRD

(*Trochilus polytmus*)

By R. DE QUINCEY (Marden, Hereford, England)

I am afraid that it was as long ago as 1939 that I promised Miss Maud Knobel, who was then Honorary Secretary of the Avicultural Society, that I would try to write an article on Humming Birds for the Magazine, but a few months later war was declared, and soon after that honey, Nestle's milk, and Mellin's food became almost unobtainable, and as time went on my Humming Birds decreased, and I felt I hadn't the heart to write or even think about birds. I also realized that at that moment I knew very little about them, and that there really wasn't very much to put on paper.

Last year our present Secretary wrote me on two occasions and asked that I should write something, but even then I felt unwilling to comply with the request because of lack of real knowledge, but it seemed that I must do something about this, since it was here (apparently for the first time in Europe) that a pair of Humming Birds went to nest.

But perhaps I had better start at the beginning. It was in 1932 that I made my second trip to South America, and, before starting out, asked Bailey if there were any particular birds that he thought the Zoo would like me to try to bring back. He suggested some of the rarer tanagers and manakins, and sundry other things, but, when I suggested Humming Birds, he rather queried the worthwhileness of such an attempt. I had one or two rather vague contacts, but for the most part had to rely on what I could pick up in the then existing birdshops of Pernambuco, Bahia, Rio, Santos, Montevideo, and Buenos Aires. As the boat called at all these ports on the way down South America's eastern seaboard, and again at the same ports on the way back, I was

able to let it be known what I would like, and was luckier than I anticipated in picking up quite a number of birds. White-capped Tanagers, Oven Birds, White Widow Tyrants (*Viudita blanca*), and a few Mocking Birds from Buenos Aires and Montevideo, and a lovely Ant Thrush from Santos. (What an interesting family these Formicaridae would be to specialize in.) This bird I gave subsequently to our late and so well-loved President, Alfred Ezra, as some slight return for his many earlier kindnesses, for when I was quite young he gave me several very beautiful sunbirds that his brother (the late Sir David Ezra) sent over to him ; the first Himalayan Yellow-backed Sunbird, and the Black-breasted Yellow-backed (*Aethopyga saturata*) were amongst those he gave me. He (Alfred Ezra) showed this Ant Thrush with considerable success at one or two National Shows before the war. At Rio I found quite a lot of small tanagers, some of them (to me) impossibly delicate and difficult, and a few manakins—and then, at last, at Pernambuco, when I had almost given up hope of bringing back any Hummers at all, no less than thirty-six were brought to the boat ! The excitement of receiving these was intense, and a spare cabin had to be rearranged considerably to house them. A member of the crew, a Mr. Read, who was a keen bird-lover and very, very clever with birds, helped me most splendidly. In fact, without his help I am sure a great many birds would have been lost early on during the trip. As soon as we struck the Channel and the usual drop in temperature, several of the little tanagers faded out, Necklace and Emerald-spotted were the first to go, and also some of the manakins, but, of the thirty-six Humming Birds we started with, we managed to land thirty-three alive. There were four Pygmy Hermits (*Phæthornis pygmæus*) among the thirty-six, and it was three of these that died, and the one that was landed alive lasted only a very short time. Mr. Read discovered on subsequent trips that these tiny birds seemed unable to stand the ship's vibration (and there is always a certain amount of vibration in any ship), but he eventually landed several alive for me, having bedded down their travelling cages in cotton wool for the journey. In those days we did not have any definite knowledge of the desirability of feeding fruit-flies (*Drosophilæ*) and the Pygmy Hermits, and I imagine all the Hermits, are intensely insectivorous. There was one larger variety of Hermit (probably *Phæthornis pretrei*, though I cannot be certain which one it was at this time) that we landed safely, and this I gave to the Zoo along with several Blue-chinned Emeralds (*Eucephala cærulea*), White-bellied Emeralds (*Thaumatias albiventris*), White-chinned Sapphires (*Hylocharis cyanus*), and White-breasted Emeralds (*Thaumatias candidus*) and I think Ruby Topaz (*Chrysolampis mosqhitus*). I retained for myself just the one Swallow Tail (*Eupetomena hirundino*), and gave a lovely tame Waterton's Wood Nymph (*Thalurania watertoni*), the only one and the first to be imported,

to Alfred Ezra. This was the tamest and the favourite bird of the lot. This little bird lived for seven years in his bathroom I believe, but escaped one day through the window. My Swallow Tail also lived for seven years, in a large, naturally planted aviary and, as it never roosted inside, it could have been said to have lived without artificial heat all that time. I have never had one do this since. Eventually on a very frosty night I think it was scared by something and flew against the wire-netting, and was found frozen there the next morning.

I think several of the species that I brought over on that occasion would have been new to aviculture in this country, as there had been only one previous importation of Humming Birds of any size, made by Major Pam in the early 1900's. In those far-off days, when he succeeded in bringing Humming Birds to England, the diet which I used when I brought mine over had not been evolved, and none of his importation lived very long. I remember it was the late Comte de Sègur, Jean Delacour, and Alfred Ezra (who had all kept Riccord's Humming Birds and Garnet-throated Caribs, previous to 1932) in their various ways experimenting, who finally evolved the mixture which at that time we all used for Sunbirds, Sugarbirds, and Humming Birds, which consisted of Nestle's milk, Mellin's food, and honey, and at night a change to honey and water. I am still not at all sure that for this country, particularly when fruit-flies fall into short supply, this mixture is not one of the healthiest and one on which all nectar feeders survive longest. The trouble with it is that, in hot weather, it is apt to go sour, and my experience was that it had to be changed every three or four hours on a hot summer's day, and with the Hummers, on that memorable trip in 1932, we often had to change this mixture every two hours, and the work entailed with these birds, about 120 in all, in that cabin which had been stripped bare, was far from light. One or other of us was usually up about 4.30 a.m., and we hadn't finished with them until 8 o'clock and often later at night. The tamer of the Humming Birds were let out of their travelling cages for a fly round the cabin at least once a day.

Between 1932 and 1939 Mr. Read brought over for me several beautiful Humming Birds from Brazil on his various trips. Then on one occasion Monsieur Cordier brought a great number over, mostly for the Continent, but his ship docked at Plymouth for a couple of hours and I managed to be there waiting for him, and on that occasion to get some beautiful Garnet-throated Caribs (*Eulampis jugularis*), and other lovely West Indian and Venezuelan species, Gilt Crests (*Orthorynchus exilis*) amongst them. Then Mr. C. S. Webb went collecting in Colombia, on which occasion there was that tragic mishap when two railway vans, containing the greater and rarer portion of his wonderful collection, were shunted into a siding, with a consequent eight-hour delay, during which time many rare things

were lost, but he did return with a few Humming Birds, and I had two most beautiful ones from him—a charming Hill Angel (*Heliangelus clarrisse*) and a Swordbill (*Docimastes longirostris*). The latter, with its beautiful slow wing-beats, was a most exciting thing to watch in an outdoor aviary that summer, but it faded after four or five months when wild-caught insects became scarce. Owing to the upward curve of its enormously long bill, we hung its feeding bottles at an angle, which courtesy it seemed to appreciate. It was very fearless and gentle. The Hill Angel was my favourite of all. He escaped from his greenhouse one day when snow was falling, and I imagined him lost for ever, but three days later I received a telephone call and learnt that a small bird was hovering round some clumps of " Wanda " primroses in a garden in the village about a mile away. Snow was lying on the ground, but these vivid little flowers were showing just clear of the snow. Hardly daring to hope that it was my most precious *Heliangelus* I hurried there with an all-wire cage and a feeding bottle. " Helio " came straight to me and started drinking hungrily from the bottle, which I gently advanced to the door of the cage, and the bird, feeding without a break, was gently but surely manœuvred, flying backwards through the door of the cage, and was safe once more. In winter he would come and pull out tiny pieces of fluffy wool from a scarf I used to wear, and was always friendly and without fear. This little bird outlived all my other Hummers, and was the last nail in the coffin of my bird-keeping activities for a good many years. The Humming Birds I had kept up to the outbreak of war were, as far as I can remember :

Swallow Tail (*Eupetomena hirondino*), Waterton's Wood Nymph (*Thalurania watertoni*), Brazilian Mango (*Lampornis mango*), Dusky Jacobin (*Florisuga atra*), Blue-chinned Emerald (*Eucephala cærulea*), White-bellied Emerald (*Thaumatias albiventris*), White-breasted Emerald (*Thaumatias candidus*), White-throated Emerald (*Thaumatias leucogastes*), Ruby Topaz (*Chrysolampis mosqhitus*), White-chinned Sapphire (*Hylocharis cyanus*), Brazilian Fairy (*Heliothrix auriculatus*), Stripe-breasted Starthroats (*Heliomaster squamosus*), Raquet Tail (*Discosura longicauda*), Delalande's Plovercrest (*Ciphalipsis delalandi*), Tufted Coquette (*Lophornis ornatus*), Giltcrest (*Orthorinchus exilis*), Pygmy Hermits (*Phæthornis pygmæus*), Brazilian Hermits (*Phæthornis pretrei*), Garnet breasted Caribs (*Eulampis jugularis*), Green-breasted Caribs (*Eulampis holosericeus*), Swordbill (*Docimastes ensifer*), Sun Angel (*Heliangelus clarrisse*).

I was determined not to start keeping birds in captivity again, but the temptation to do so returned. I don't just remember what started the germ reasserting itself, but it was at one of the post-war National Cage Bird Shows that I fell. I bought a pair of Virginian Cardinals, which I found I could not compare with those pre-war excitements,

and the next year I bought a pair of Lesser Collared Sunbirds from Mrs. Scamell, which only whetted the appetite to have Humming Birds again. In that spring, two Humming Birds, Golden-throated, arrived with Percy Hastings—one for the Zoo and one for me, but I changed mine with Raymond Sawyer for a Pucheran, as he wanted the Golden-throat which was new to him, and I was delighted with the Pucheran, the most charming little fellow I have ever had of that species, very tame and intelligent, and a great vocalist in his own estimation. He was a great favourite, and lived about four years. The old greenhouse home of pre-war Humming Birds was restored, and our one and only Percy Hastings had a sort of request to let me know when he had any nice birds. Since then quite a lot have come over and found their way here, some in good form, others very frayed about their wing-feathers, or with that horrible fungoidal tongue trouble, that I am sure they get from dirty bottles or incorrect feeding, and from which there seems to be no recovery. To receive a little parcel of eight Frilled Coquettes—and to find them all going wrong in the tongue from the moment they arrive—is very daunting, as one can do nothing apparently for this that is effective, and I have tried several things—iodine, chloromycetin, and other suggestions. Then, in the spring of 1957, Raymond Sawyer asked me if I would like some Doctor Humming Birds (*Trochilus polytmus* (Linn.)), or Streamer-tails. I said I should welcome them gladly, and in due course he received four of these from a friend, three cocks and one hen. He kept a very fine cock bird for himself, and I had the others. I lost one cock bird in the spring of 1958. It had never been as fit as the other two, and was rather an aimless sort of soul. The hen and the other cock moulted out perfectly, and were put out again into my old pre-war greenhouse and open-flight in April. The hen, a very confiding and tame bird of very considerable character, was soon seen to be looking about for cobwebs, and hopes ran high that she might be thinking about breeding, and then a few days later the cock bird, apparently in perfect condition, was picked up dead. The hen seemed determined in her efforts to find nesting material, so cobwebs and lichens and some teased-out sheep's wool and hair were supplied for her to sort out. She built a very flimsy nest, attached to a branch and a leaf of a tall bush of the tender *Rhododendron rhabdotum*. She laid two eggs on two successive days, but the nest toppled over and one egg was broken. She then started building on top of this original nest, but this rather more robust structure was still far from secure, so I wrapped a hair-net round the nest and secured this to the branch somehow. The hen watched the proceedings with interest and no sense of alarm, and seemed grateful for this assistance, and she completed the nest and laid two more eggs, again on two successive days, but somehow she did not seem satisfied with matters. Feeling extremely

doubtful by this time that her eggs would be fertile, I managed to persuade Raymond Sawyer to let me have his cock bird, as this was, by this time, known to be the only remaining cock Streamer-tail in the country—but we agreed that if Mr. Sawyer should want this bird at any time to show he could have it back, and it was indeed a very kind gesture on his part to let the bird out of his care at all, seeing the tragedies I had had with mine. Almost as soon as Raymond Sawyer's cock bird was introduced, there was a lot of excitement and displaying on his part, attentions to which the hen bird was not insensitive, and it is certain that they mated, although this was not actually observed. The hen built another portion of superstructure on top of her second nest and its two now unwanted eggs, and on 23rd May, 1958, laid her first (really her fifth) egg, and on 24th May there was a second (sixth and last) egg in this nest. The cock bird made no attempt to help with the building of the last part of the nest, but, when the hen was on the nest, he perched within about a yard of it, and her, for the first two or three days of incubation, and drove away any other bird that happened to come near. After these first two or three days he took up a position in the outside flight, and took no further notice of the hen or the nest. The first chick hatched out on 10th June, the second on 11th June, not less than twenty-four hours and not more than thirty-six hours after the first one. The hen alone fed the two chicks, which, as they grew older, she did without ceasing. A vast number of fruit-flies were bred and released within the greenhouse, and she fed herself on these and the nectar mixture, and then regurgitated it, seemingly pumping it right down into the crops of the two young birds. They grew very fast and were apparently very strong, pushing themselves up to the edge of the nest backwards to excrete. The edge of the nest began to be pretty unpleasant and sticky, but the young birds remained clean, and by 30th June appeared to be fully feathered. On that day I noticed the hen was flying more weakly than usual, and unfortunately I had to be away from home just at that moment, although I do not think I could have done any more than was done, had I been at home. I was back on Friday, 4th July. The hen was weak and obviously failing, but still feeding the two young ones. On Saturday, 5th July, I found the hen and one young one dead. I feel that laying six eggs in fairly quick succession may have weakened her, and this, followed up by her incessant maternal duties, and probably not exactly the necessary amounts, or proportions, of an attempted compensation for what she would find to feed on in the wild state was just too much for her constitution. I think she may have pierced the œsophagus of this young one in her weakened state when trying to feed it, for it died with a curious, darkened swelling under the skin on one side of its throat. The other young one climbed on to the side of the nest and started using its wings. We fed it by hand

from the nectar bottle several times, and shortly after this it left the nest, flying a short distance. The next time it started to fly it landed on the ground, so I picked it up and put it into one of the usual Humming Bird travelling cages, where it seemed quite intelligent, and fed itself and stretched its wings, flying from its perch and landing on it again. Whether, when it landed on the earth floor of the greenhouse, it picked up some dirt to cause an infection in one eye, or, whether this damage was done in some other way, I don't know, but on 8th July I noticed one of its eyes was gummily closed. I treated this with penicillin cream, but it only scratched this with its foot, and the next morning it was obviously unwell, in fact it was torpid. Although later in the day it " came to " and seemed to improve, it did not last out the day. My record reads : " On 9th July the remaining young Hummer died." This young bird left the nest on its own, and fed from a nectar bottle on its own, for a matter of four days, and it died in full, or virtually full, youthful plumage, but I feel myself that it was a " near miss " rather than a complete success story. The youngster was coloured just about the same as the hen, although, of course, its tail-feathers were shorter, being not so completely developed, and the green on its back not so iridescent. I felt sore with the cock bird for not helping out when the hen got weak, but I suppose he was only behaving in the normal way, and in his own country in the wild state he would, I imagine, have done no different. That is really the end of my story. The cock bird remained in the greenhouse until November, 1958, when my new " Humming Bird Tropical " was completed, and I then moved him into this rather better place, where he moulted out again and really looked more beautiful than ever. When Raymond Sawyer came down in the autumn and saw him, it was only natural, and also right and in line with our agreement, that he should say : " Please, I would like him back to show at the National." So back he went to London, as sensible as any show bird could be. Some time after that Show, Raymond Sawyer said he was going to bring him back here again, saying that the bird was so fit here, and he thought he should enjoy his greater freedom, which again I think was very pleasant of him. I only hope that in the not too distant future I can get hold of another hen, but I feel this is rather unlikely. The Doctor, as Jamaicans always call this bird, since his return, has been flirting rather shamelessly with a hen Wood Nymph (*Thalurania glaucopis*) to the enraged disgust of her proper mate ! Although there will be no hope of breeding " The Doctor " unless some kind person provides me with a mate for him, I do start off this year with two or three different true pairs of Humming Birds, a thing I have never managed to do before, and I hope that perhaps one of these pairs will do this new place that I have had built for them the honour of trying to breed there.

You will have noticed that on occasion I have used the word " we " instead of " I ". I would like to make it very clear that I am not using the " Royal plural ". The " we " includes Jack Minton who has looked after the increasing bit of garden here, the various engines that make our electric light and pump our water, and last, but not least, the birds, and I must say that he has shown an interest and devotion to the birds, and has on many occasions done very wise things to make matters better for them. And " we " for the last two years has also included June Rushton, whom " Uncle " Jack has taught to " take the birds off him ", and Miss June has come to think a lot of her birds, and gradually to understand them and, I feel sure, to love them, which is I think a good thing for her and certainly for the birds. But " Uncle " Jack maintains a watchful eye, and I feel a sense of appreciation of this devotion. Anyway, between them very little is allowed to go wrong on the many occasions I seem to have to be away from home. Only yesterday Miss June noticed and called attention to the fact that the spout of one of the Humming Bird bottles was full of a kind of thin fibre. Minton worked it out and came to the, obviously right, conclusion that this was fibre from the trunk of a tree fern, taken there on the bill of some Humming Bird. Can it be that the hen *glaucopis*, or the hen Blue-tailed Sylph, has decided to think of building, and is trying to make this material softer and more sticky by putting it there, in order to start a nest? I'm afraid there will be a lot of watching going on the next few days, to see if this is a reasonable deduction, and, if so, to see that the " nest to be " does not get too soused with water when the tropical-house is sprayed down. It is difficult enough missing the flowering spikes and young growths of the orchids growing on the dead tree-stumps in this place! The keeping of Humming Birds certainly keeps one alerted, and is one of the things in life that gives one a bit of " something to look forward to ".

A word concerning the way we feed Hummers here at the present time, and it is very simple. I started off after the war by using Hastings' Stimulite by day, and with a change to honey and water at night (plain three nights, with Abedecin two nights, and with Haliborange two nights, each week). I found the birds got too fat after about ten months on this feeding, and would die in fits although looking terribly fit. We now use one dessertspoonful of Stimulite to five dessertspoonfuls of honey (locally collected and pure) in about 1¼ pints of hot water (hot to melt the Stimulite and honey), and we use this day and night, topping up the bottles at about 3 p.m. in winter, and at about 5 p.m. in summer. All bottles are scalded and brushed every morning and with this mixture we feed as many fruit-flies as we have on hand. The birds are not so fat on this feed, and are I think as fit as any I have seen anywhere recently. I think cane sugar, which Snr. A. Ruschi, who must be the greatest living expert on living

Humming Birds, uses in Brazil may be safer than bought proprietary brands of honey, and I wish we could breed the minute species of spider that he uses. I think if members would like further and far more authoritative information about keeping Humming Birds than I, with my very limited experience, can give, the Editor might seek to have Snr. Ruschi's vastly interesting and knowledgeable articles on Humming Birds translated and given in serial form in this Magazine; but probably the number of Humming Bird maniacs in this country is limited !

The species that have been kept here since I started keeping birds again are :

Mangos, various Emeralds, Waterton's, Swallow Tails, Jacobins, and Starthroats, as pre-war, and the following (new to me) : Golden-breasted Humming Bird (*Chrysobronchus*), Pucheran's Emeralds (*Chlorostilbon prasinus*), Sun Gem (*Heliactin cornuta*), Red-throated Sapphire (*Hylocharis sapphirin*), The Doctor (*Trochilus polytmus*), Frilled Coquette (*Lophornis magnificus*), Sombre Humming Bird (*Aphantochroa cirrochloris*), Brazilian Ruby (*Clytolæma rubinea*), Brazilian Wood Nymph (*Thalurania glaucopis*), Coppery (*Chrysuronia chrysura*). Emeralds : two unidentified species : I don't know where they came from, so cannot be certain which they were. They lived about ten months outdoors, but died on the " too fat diet ". They were larger than any I have had from Brazil, one with a wedge tail and one with a rounded tail, blue black. Blue-tailed Sylphs (*Cyanthus cyanurus*), Train Bearers (*Lesbia amaryllis*), Gould's or Bogota Train Bearers (*Lesbia gouldi* (*gracilis*)), Mulsant's Wood Stars (*Calothorax mulsanti*), Violet Ears (Colombian—from Ecuador !) (*Petasophora iolata*), ? Copper-tailed Erethrynodes (*Amazilia amazilia*), Colombian Emerald (*Chlorostilbon augustipennis*), Atalas Emeralds (*Chlorostilbon atala*).

Names have mostly been taken from Gould's Monograph, but these can well have been reclassified since, as the various museums seem to alter their ideas as to local species and variations of these species, and certainly many new species and sub-species have come to light since that monumental and beautiful work was compiled. Referring to Gould's work, it is quite amazing with what wonderful accuracy the natural and actual pose repeatedly taken up by so many of the species in real life has been portrayed, and in how comparatively few of the illustrations the birds are in a " stuffed glass-case " position.

* * *

NOTES FROM THE NEW GROUNDS

S. T. JOHNSTONE (Slimbridge, Glos., England)

The Collection at Slimbridge now comprises 165 kinds and readers interested in seeing some of the rarer species of waterfowl may like to know that the following are on view at New Grounds :—

Northern Red-billed Whistling Duck (*Dendrocygna autumnalis autumnalis*), Spotted Whistling Duck (*Dendrocygna guttata*), Trumpeter Swan (*Cygnus cygnus buccinator*), Whistling Swan (*Cygnus columbianus columbianus*), Richardson's Goose (*Branta canadensis hutchinsii*), Great Basin or Moffitt's Canada Goose (*Branta canadensis moffitti*), Ne-ne or Hawaiian Goose (*Branta sandvicensis*), Black-backed Radjah Shelduck (*Tadorna radjah radjah*), Red-backed Radjah Shelduck (*Tadorna radjah rufitergum*), Andean Crested Duck (*Lophonetta specularioides alticola*), Falkland Flightless Steamer Duck (*Tachyeres brachypterus*), Bronze-winged Duck (*Anas specularis*), Salvadori's Duck (*Anas waigiuensis*), Hottentot Teal (*Anas punctata*), South Georgia Teal (*Anas georgica georgica*), Kerguelen Pintail (*Anas acuta eatoni*), Sharp-winged Teal (*Anas flavirostris oxyptera*), Australian Grey Teal (*Anas gibberifrons gracilis*), New Zealand Brown Duck (*Anas aucklandica chlorotis*), African Black Duck (*Anas sparsa sparsa*), Abyssinian Black Duck (*Anas sparsa leucostigma*), New Zealand Grey Duck (*Anas superciliosa superciliosa*), Laysan Teal (*Anas platyrhynchos laysanensis*), Hawaiian Duck (*Anas platyrhynchos wyvilliana*), Cape or South African Shoveler (*Anas smithi*), Blue or Mountain Duck (*Hymenolaimus malacorhynchos*), Baer's Pochard (*Aythya baeri*), Australian White-eye (*Aythya australis australis*), New Zealand Scaup or Black Teal (*Aythya novae-seelandiae*), Lesser Scaup (*Aythya affinis*), Ring-necked Duck (*Aythya collaris*), Cotton Teal (*Nettapus coromandelianus coromandelianus*), African Pygmy Goose (*Nettapus auritus*), White-winged Wood Duck (*Cairina scutulata*), Hartlaub's Duck (*Cairina hartlaubi*), King Eider (*Somateria spectabilis*), Steller's Eider (*Somateria stelleri*), Common Scoter (*Melanitta nigra nigra*), Long-tailed Duck (*Clangula hyemalis*), Hooded Merganser (*Mergus cucullatus*), Smew (*Mergus albellus*), American Merganser (*Mergus merganser americanus*), North American Ruddy Duck (*Oxyura jamaicensis jamaicensis*), Maccoa Duck (*Oxyura maccoa*), African White-backed Duck (*Thalassornis leuconotus leuconotus*), Black-headed Duck (*Heteronetta atricapilla*).

A wonderful summer produced about 1,000 young birds of eighty-eight forms. Over 100 kinds of waterfowl laid in the Wildfowl Trust's Collections ; some of these nested for the first time ever in captivity and some for the first time in Europe.

The old Magpie Goose again raised a family helped by the male and the other adult female, the latter taking an intense interest in the

young and the parents being very happy to have the services of the nursemaid.

Cuban, Fulvous, Wandering, and Southern Red-billed Whistling Duck produced eggs and reared young. We have five Spotted Whistling Ducks in our heated aviary and late in August a female laid her first egg in a wooden kennel. In all there were eleven eggs, dead white as in other Whistling Ducks, but more ovate and of a finer texture, measuring 5·2 × 3·8 cm. and weighing 44 gms. It was decided to let the parents incubate, but to our dismay on the twenty-first day both birds were in the run and the eggs stone cold ; the construction of a metalled road a few feet from the nest may have contributed to the desertion. We have a small electric incubator which is kept running for such emergencies and the eggs, after candling for fertility, were transferred to this. We kept our fingers crossed and after a further ten days all eleven eggs hatched, the young being dark brown with the characteristic head and neck markings of the Whistling Ducks. The body markings, however, differ from all other Whistlers we have had in that the spots on the back join to form a band of cream on either side, which makes them quite distinctive and altogether different from the downies of the Cuban Whistling Duck which might otherwise be supposed to be closely related.

The young birds were put in one of our brooders and heat supplied with an infra-red lamp, food offered being freshwater shrimp (*Gammarus*), minced egg, duck weed, and maggots. The ducklings quickly became imprinted on the hand of the person tending them and would climb on to it whenever one moved feeding dishes. Their tameness was all the more enchanting having regard to the usual wildness of young *Dendrocygnini*. But, alas, they were not feeding well and after three days two died. The following day, a third had succumbed ; what to do ? It was September and all the broody hens had been finished for some weeks, but we had one female Cuban Whistling Duck which was rearing its three hybrid month-old young in the aviary, so it was decided to make a switch. The Cuban mother was shut in her hut and her young removed to the brooder. At the same time, the remaining Spotted ducklings were put in with the adult bird and an infra-red lamp. The Cuban made no attempt to take on the new family, but at least she did not attack them. After two or three hours a visit was paid to the hut and on seeing the visitors, the foster mother called all the youngsters over to her. Furthermore, she was teaching them to eat turkey starter crumbs. After twenty-four hours, the hut was opened and the family allowed freedom of the run and pond. Returning later it was found that the foster-mother had left the brood and was walking up and down the wire-netting trying to get out. Six ducklings were huddled together ; one was dead and the eighth was prostrate. The last was put back into the incubator

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To face p. 168.

SPOTTED TREE DUCKLINGS.

[Philippa Scott

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HARTLAUB'S DUCKS.

[Philippa Scott

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and the adult and the remaining six ducklings shut up again. After a few hours the seventh duckling revived and was returned to the brood. Five days later the foster-mother had forgotten her own ducklings and became greatly attached to her new family. These seven ducklings were reared without trouble. Feathering commenced at twenty-seven days and was complete in seven weeks. We believe that this is the first time this species has been bred in captivity.

The Bewick's Swans bred again and had four cygnets, two of which died from Acuaria (parasitic worm) infection.

One of the three pairs of Trumpeter Swans laid two eggs two weeks apart. After the first egg the hen showed no signs of incubating it, or laying more, so the egg was put under a Black-necked Swan, but failed to hatch. The Trumpeter pen sat on the second egg, but it was taken by a mystery predator, possibly a stoat. We hope for better things next year.

The Black Brants again nested and three goslings were raised. A Black Brant female paired to an old Light-bellied male produced two fine goslings.

Ne-ne production was twenty-four young hatched of which twenty-two were raised and Terry Jones added another eight to the flock.

The Bronze-wing Ducks nested, but unfortunately we have not as yet acquired a male.

After many years of hoping, a pair of Baikal Teal at last nested and laid six eggs. The nest was not discovered until well on in the incubation period. Five ducklings hatched but, though feeding well, they did not thrive and only two females were reared.

The Laysan Teal on loan to us from the United States Bureau of Sport, Fisheries and Wildlife had been housed in our old aviary and seemed happy and very tame. Eventually the female laid four enormous eggs similar to Mallard. These proved infertile and a second clutch of six eggs were divided between the parent bird and a broody hen. After twenty-six days, the parent bird hatched a single duckling, a very tame little thing that was unfortunately killed by a weasel, and of the three eggs under the bantam, one duckling was duly hatched and reared. The downy young is rather ginger-coloured and quite different in superficial appearance from others of the group, like the Koloa or the Mallard.

The New Zealand Grey Duck presented to us by the Department of Internal Affairs for New Zealand bred at Peakirk and produced five birds.

A pair of Australian White-eye which had arrived in 1958 nested twice in one of the boxes in the Australian pen. Eight eggs were laid, the incubation period being twenty-seven days. The ducklings were larger and paler than those of the Ferruginous Duck. They thrived and all seven that hatched were reared ; three hatched by the parents

were also reared. We do not know of this species ever having been reared in captivity before.

The full-winged Hartlaub's Duck, which had bred in the old aviary, had been moved early in the year to their quarters in the new aviary, where they had much more space and freedom to fly and perch, but it seemed that moving them was going to interfere with a second attempt at nesting. However, the first egg was laid at the end of July, in some thick ground vegetation. Nine creamy, pear-shaped eggs were laid measuring 5·3 × 4·0 cm. and weighing 51 gms. Vast quantities of pale grey down were pulled although the female was seldom seen off the nest. Eight ducklings hatched after thirty-two days ; they were brown with a black cap to the head, yellow underparts and yellow blotches on wings and sides of back. There is a distinct eye stripe and the bill and longish legs are black. The ducklings appear more like young African Black Ducks, or even Mallards, than they are like Muscovy Ducks or Comb Ducks, their supposed closest relatives.

Both parents were very aggressive in defence of their brood, most of which thrived. Feathering commenced in twenty-eight days and was completed in eight weeks, when the five ducklings that remained were separated from their parents on account of the male's bellicose intentions towards his off-spring. Surprisingly there was no dull coloured immature plumage, as in young Comb Ducks. From the down the young Hartlaub's moulted straight into a chestnut plumage with black head and blue-grey shoulders. It is interesting to note that when this pair of birds first bred in 1958, they were only one year old.

A Spurwing Goose nested and laid eight eggs, but, unfortunately, none was fertile. Both forms of the Comb Duck were among the other perching ducks to nest. Barrow's and Common Goldeneye nested and young were reared. Red-breasted Mergansers produced three young, but the breeding for the first time of the Hooded Mergansers was overtaken by tragedy. The female in our Orchard pen nested in April, using one of the small boxes raised some 4 ft. from the ground. Our intention had been to allow the parent bird to incubate for some fortnight or three weeks and then transfer the eggs to a bantam for hatching and rearing (a method that had proved satisfactory with the Smew). Unfortunately, the female refused to sit more than a few days and the bantam carried on from the fifth day. Five of the six eggs reached the pipping stage, but failed to hatch. The eggs were dead white and almost spherical, measuring 4·6 × 3·6 cm. and weighing 49·25 gms.

We are looking forward to next year's breeding season now. We wish we could somehow obtain a male Bronze-winged Duck so that the eggs which have been laid annually for the last five years could at last be fertile. We hope for greater success with the Trumpeter Swans, the Laysan Teal, and the Hooded Mergansers, and among the species

which have never bred here, we shall especially be watching the Salvadori's Ducks, the New Zealand Brown Ducks, the White-winged Wood Ducks, the King Eiders, and the Common Scoters.

* * *

BREEDING RESULTS AT THE KESTON FOREIGN BIRD FARM IN 1959

By Edward J. Boosey (Keston, Kent, England)

The following parrots were bred at Keston during the 1959 Season :—African Grey Parrots, Blue-fronted Amazons, Festive × Red-throated Amazon hybrids, and Cuban Amazons. The latter are of particular interest as they are second generation Keston-bred. A fine brood of four were reared, the hen being an imported specimen and the cock being one we bred here several years ago. Red-sided Eclectus had clear eggs, as did Yellow-fronted and Yellow-naped Amazons, and the hen of a pair of Levaillant's Amazons sat for a fortnight—apparently on nothing.

A brood of young Leadbeater's Cockatoos died in the nest, owing to an accident, when about half-grown.

Six young blue Ring-necks and several young lutinos were reared. Other parrakeets bred included : Pileated, yellow Red-rumps, Turquoisines, Stanleys, Golden-mantled Rosellas, Layard's etc. The Layard's did particularly well, eight young ones being reared. These consisted of four from an imported pair and four from a brother and sister pair bred here at Keston.

A large number of Peach-faced Lovebirds as well as many normal and some blue-bred Masked were bred, and also many thousands of Budgerigars of all the various colour varieties.

Our pair of Amethyst Starlings, which successfully reared two young ones in 1958, again went to nest, this time rather late, and hatched one young one which, however, they threw out of the nest when it was quite well-grown. This may have been partly due to the fact that they were being given too many mealworms for the rearing of a single young one, and thus became over-stimulated, which seems probable, as the hen laid again so quickly that all the eggs were clear. Another cause, however, may have been that, this time, the aviary next to theirs was occupied by another pair of Amethyst Starlings, and there was a good deal of bickering between the two pairs through the wire netting.

The second pair consisted of an imported hen mated to one of the old pair's sons, bred here in 1958. This hen went to nest quite early,

and the young cock, although still in hen-like juvenile plumage, except for a few small irregular patches of purple on the back, was very attentive to her, but the eggs were clear.

It may be of interest to record that now (January, 1960) he has nearly assumed full adult male plumage, and the process is curious because, as in the case of weavers and whydahs, it does not seem to be achieved by anything that could be called a complete moult ; what happens being that the specklings on the breast gradually disappear until it finally becomes pure white, and the irregular patches of purple on the back gradually spread until the throat and the whole of the upper surface are purple. Thus, judging by our young cock, I think one can say that the transition from juvenile to full adult plumage becomes complete in the third year.

Our pair of Peruvian Green Jays (*Xanthura yncas*) made a nest which was found empty at the end of the season, and it seems probable that they laid, but, as members of this family are so prone to do in confinement, ate either the eggs or else the young ones when first hatched. When the pair came to us they were blue and white, and it is rather interesting that, after their last moult, the blue has become suffused with the original green colour, and the white with yellow. This, we think, may be partly due to the fact that they were given a daily supply of elderberries when moulting.

We only put a few finches up to breed, but Parson Finches and the various colour varieties of Zebra Finches did well ; a pair of Black-cheeked Waxbills went to nest, and as this must be a rare event, it was doubly disappointing that, while sitting, they had their nest destroyed by mice. Our pair of Purple Grenadier Waxbills again went to nest rearing one young one, but we finally decided to part with the parents, because, willing as they are to go to nest, it seems that a regular daily supply of live ant pupae is absolutely essential if they are to rear their young successfully, and searching for and keeping up a continual supply of these entails a lot of work.

A breeding result of exceptional interest was the rearing of seven young ones (in two broods of five and two) by a pair of Western Bluebirds *Sialia mexicana*, a species which, as far as I am aware, had only previously been bred in this country by Mr. Ezra before the war. We also, as last year, bred its close relative the Mountain Bluebird *Sialia currucoides*.

The American Bluebirds are nowadays extreme rarities in British aviaries, yet in my very young days the Common or Eastern Bluebird *Sialia sialia* (then always known here as the " American Blue Robin ") was quite a common cage and aviary bird in this country, so much so that it was recommended for the beginner—rather rashly I think—and was obtainable for about 30*s*. a pair. I believe the last person to have kept and bred the Eastern Bluebird in this country was the late

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Cock Western Bluebird (*Sialia mexicana*).

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Liberty pair of Crested Bronze-winged Pigeons at Keston.

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Dr. Maurice Amsler, during the early 1930s, and older members of the Society may remember his experiments in using our native Robins as foster-parents by putting the Bluebirds' eggs in their nests, with rather variable results. Not because the Robins did not make excellent foster-parents, but because Dr. Amsler found that the eggs or young were so often destroyed by predators of one kind or another.

All three species of the Bluebirds are extremely beautiful and delightful aviary inhabitants with their soft warbling notes and swift glancing flight. They can be bred in large flight cages, but it is really best to devote a moderate-sized aviary to each pair. They are quite simple to cater for, requiring only a good quality insectivorous mixture plus a daily allowance of gentles and a few mealworms.

The two species that are most alike are the Eastern and the Western Bluebird but, roughly speaking, they can be distinguished in the following manner : The Eastern Bluebird is lightish cobalt blue above with the breast brownish-chestnut merging into whitish in the vent area. The Western Bluebird is of a deeper cobalt blue above and has the throat grey-blue, the rest of the underparts being the same as in the Eastern. But perhaps the chief distinguishing feature is that the Western has an area of brownish-chestnut on the back and mantle. The Mountain Bluebird is quite distinct being bright sky-blue above and having the under-surface a pale mottling of light grey and buff. In each case the blue is particularly brilliant on the wings and tail so that the birds are seen at their spectacular best when in flight.

Although they are so closely related, there seems to be a marked difference temperamentally between the Western and the Mountain Bluebird. The latter have to be separated out of the breeding season as they squabble incessantly, and even when breeding they indulge in a certain amount of chasing about and clicking of beaks. A pair of Western Bluebirds, on the other hand, can safely be kept together all the year round, which of course is a great advantage, as it is a nuisance to have to devote two aviaries to a single pair of birds or alternatively to cage them separately during the winter.

During the summer we received a pair of small birds of considerable interest, which are obviously a rare and possibly unique colour mutation of the Common Firefinch ; the cock, instead of being red, is orange in colour, and the hen is equally distinct. We hope to breed from them next season.

Having bred a number of the very handsome Australian Crested Bronze-winged Pigeons in aviaries, we decided in the spring to let out a pair, and they proved to be most delightful liberty birds, very tame and excellent stayers even in quite a small garden. They nested in one of a row of trees bordering the lawn in front of our house and close to a lily pond—they are said always to choose the vicinity of water—and could usually be seen, either pecking about on the lawn, or sunning

themselves on an adjoining rose trellis. They managed to rear one young one in their second nest, but both their first and third nests came to naught—I am pretty certain because either the eggs or young were eaten by Magpies. We wage perpetual war against these beautiful pests, which have killed more than one newly-fledged parrakeet from outside the aviary by pecking it as it clung to the wire netting ; yet so numerous are Magpies in this country nowadays that no sooner has one disposed of one pair than another couple promptly take their place.

The wings of the Crested Pigeon make a loud whistling sound which can be clearly heard in the house, and their flight is very dashing and spectacular and incredibly swift. It consists of a series of loud, rapid wingbeats to get up speed, followed by a long glide, after which the same process is repeated. As liberty birds they have two great advantages, namely that they are just big enough to be immune from cats, and—judging by the behaviour of ours—they do no damage in the garden. During the past sunny summer I often watched the male courting his wife on the lawn in front of our house. It is a very beautiful display as he bows low before her with upraised fanned-out tail, and partially-lowered wings, thus bringing the two brilliantly metallic areas of emerald-green and purple-bronze on the latter into special prominence.

Crested Bronze-winged Pigeons have of course been kept at liberty several times before in this country—notably at Woburn during the first decade of the present century—but I think it is interesting that they will do so well, not only in a large park, but also in an ordinary garden of a few acres in extent.

* * *

EARLY ILLUSTRATIONS OF NATURAL HISTORY

(Summary of an illustrated talk given to the British Aviculturists' Club on 11th January, 1960)

By A. C. Townsend, (Librarian, British Museum (Natural History), London, England)

Although we must bear in mind such ancient examples as the cave-paintings of the Palæolithic hunters, and the decorations of the temple walls at Karnak, it is with the history of book-illustration that we shall be principally concerned. The art is of considerable antiquity, being probably derived from Egypt, the home of ancient book-production. Some authorities are of the opinion that the illustration of books began in earnest when the papyrus rolls (*volumina*) gave way to the parchment *codices*, bound in book-form, which came into general use sometime during the fourth century A.D., if not earlier.

It is from the fourth century that we have the earliest extant codices, though the famous Vienna Codex of Dioscorides, also known as the Codex Aniciæ Julianæ, dates from the sixth century. This illustrated codex was written about A.D. 512 at Constantinople as a gift for the Lady Anicia Juliana, whose father had been for a while Emperor of the West.

The original compiler, Pedanios Dioscorides, was a medical man who flourished during the first century A.D., and whose book, known generally under the Latin title of *De Materia Medica*, had an influence which persisted right down to the seventeenth century.

It seems, however, that some of the pictures in the archetype of Dioscorides derive from originals of a much earlier date and were not made for his text. They probably go back to a rather shadowy individual mentioned by Pliny, called Krateuas, who was physician to the redoubtable monarch Mithridates in the second century B.C. According to Pliny, Krateuas depicted plants in colour, and has thereby earned the title of " the father of botanical illustration ". Thus at the date of the preparation of the Vienna Dioscorides, naturalistic drawing was already on the wane : it is almost certain that the illustrator of the manuscript copied the pictures in an illustrated Krateuas, and thus followed a custom which deviated more and more from the naturalistic fashion that had prevailed in the Hellenistic–Roman period.

The Dioscorides manuscript also contains some bird-pictures which seem to have been intended for an ornithological treatise.

Sometime in the fifth century a new Latin herbal appeared, with its text based chiefly upon Dioscorides. The illustrator of this work, which is known as the *Pseudo-Apuleius*, did not draw upon direct observation of the plants, but depended on the tradition of plant-pictures which goes back to Dioscorides, but with an increased stylization and an ever-growing deviation from the natural forms.

After Galen (A.D. 131–201), down to the thirteenth century, biology has little or no history, for plants were of interest almost entirely for their medical importance, and animals were of symbolic rather than of scientific significance. Thus the Herbal and the Bestiary became of paramount importance.

The Bestiary, which probably originated in Egypt about A.D. 370, has been described by the late Dr. M. R. James as " a kind of moralized natural history illustrated with curious pictures ". It was translated into many languages and exercised a great influence on the ecclesiastical art and general culture of the Middle Ages. The clerical mind asked itself what it could learn from animals. The " nature of the beast " became, in each instance, pure fancy. For example, the Fox, when hungry, feigns death, and so catches the birds that light upon it to feed—and such are the works of the Devil. The Whale, too, lures

mariners to anchor their ships upon his body, and then, down he goes, dragging the ship and the crew with him, like people who place their hopes in the Devil and his works, and who are finally swallowed up in the fiery gulf of hell.

Perhaps we can leave the Bestiary by quoting once more from Dr. James : " Whenever you see a griffin on a crest, or supporting a coat-of-arms, or a Pelican plucking at its breast, or a Phœnix on a life-insurance badge, or, most familiar of all, a Unicorn, you are looking at something which, but for the Bestiary, would not have been there." And we still talk about " crocodile's tears " and of bears " licking their cubs into shape "—both met with in the Bestiary.

In contrast, however, we should mention the work of perhaps the first ornithologist of importance known to history—the *De Arte Venandi cum Avibus*, a treatise on falconry by the Emperor Frederick II of Hohenstaufen, which was completed about 1488. Some copies of this have many marginal illustrations in colour, depicting numerous species of birds. It should be remembered, however, that in the thirteenth and fourteenth centuries, naturalistic illustrations of animals, though often the product of close observation, were decorative in intention ; they accompanied no relevant text, and were contemplative rather than explanatory.

With the advent of printing, Konrad von Megenburg's *Puch der Natur*, first printed at Augsburg in 1475, is of considerable interest, as it contains what is probably one of the earliest pictures of birds in a printed book, and also because the woodcuts seem to have been prepared, not merely for decorative purposes, but with the definite intention of illustrating the text. This is an important step forward : the preparation of these woodcuts impelled observation and rendered it more acute.

An interesting contemporary work is Bernard von Breydenbach's account of his travels to the Holy Land, published at Mainz in 1486. The author was Dean of Mainz, and he went on his pilgrimage accompanied by an artist, Erhard Reuwich, of Utrecht. The single plate of animals in the book is well drawn, and the camel and the giraffe, though appearing somewhat out of place among a number of fantastic-looking creatures there displayed, seem to have been drawn from nature, and are probably the earliest printed illustration of these animals portrayed in a realistic manner.

Another popular illustrated work of this period was the *Dialogus Creaturarum*, a book of fables by an unknown Dutch author, printed at Gouda in 1480 by Pieter van Leuw. The book contains 121 illustrations, the delicate outline of which well conveys the humour of the text. An English version appeared *c.* 1517 (reprinted in 1816), and is probably the first English book in which we find those characteristic couplets appended as morals at the end of the fables " which sink ",

as we read in a bookseller's catalogue of some years ago, " into the memory with more power than finer literature or erudition of greater importance ever attains." For example :

" They that be rulers may nothinge avayle
If they that be undyr of helpe doth them fayle."

A more primitive style of woodcut is to be found in Trevisa's version of the medieval encyclopædia of Bartholomæus Anglicus, printed by Wynkyn de Worde before the end of the fifteenth century. This contains one of the earliest illustrations of birds in a book printed in England, and the book itself was the first to be printed on English-made paper, from the mill of John Tate of Hertford, the first paper-mill to be set up in this country (see Figure).

The *Hortus Sanitatis*, printed at Mainz by Jacob Meydenbach in 1491, is very rich in illustrations. Although the botanical part of this herbal derives from an earlier work, the animal part seems to be nearly all new. About one-third of the figures of herbs is also new, and the rest are copies on a reduced scale from the German *Herbarius*, printed at Mainz in 1483, and are much inferior to their originals.

During the sixteenth century an advance seems to have been made in all branches of book-illustration, which is possibly due in part to the influence of Dürer (1471–1528), who had begun to practise wood-cutting, and perhaps to Leonardo, who had produced some exquisite plant-drawings.

Certainly a new era in botanical drawing opened with the publication in 1530 of Otto von Brunfels's *Herbarum Vivae Eicones*, which marked the beginning of a truly naturalistic type of botanical illustration—the work of the artist Hans Weiditz, some of whose drawings had formerly been attributed to Dürer.

With Leonhart Fuchs : *De Historia Stirpium* (1542), with its splendid folio page, fine printing and lay-out, " plant illustration," to quote Dr. Agnes Arber, " may perhaps be held to have reached an even higher level than in the work of Brunfels."

At the close of the sixteenth century, engraving on metal had begun to supersede the art of wood-cutting. The earliest botanical book in which copper-plate etchings were used is probably Fabio Colonna's *Phytobasanos*, published at Naples in 1592.

In zoology, of particular interest is the great work of Conrad Gesner [1516–1565], the bird part of which was published at Zurich in 1555. The woodcuts in Gesner's work—there were over 1,000 of them—were copied and recopied for more than 100 years.

With the work of Pierre Belon, of Le Mans, whose treatise on birds appeared in 1555, direct observation of natural history objects may be said to have begun. Belon's book, with its 160 figures, is probably the first book to be devoted solely to ornithology.

[*John Rylands Library*

An early illustration of birds in a book printed in England. (From *Bartholomeus de proprietatibus rerum*, printed by Wynken de Worde, *c.* 1495.)

The seventeenth and eighteenth centuries witnessed the practice of forming " cabinets " of natural history, designed to contain specimens from all parts of the world. For example, the influx of new plants from America and the Orient, gave rise to sumptuous books such as Linnaeus's *Hortus Cliffortianus* (1737), with drawings by Georg Dionysius Ehret, made for the wealthy banker Cliffort, of Haarlem.

Much stimulus was given to natural history illustration by the explorations abroad which were going on at this time. We may remember the three voyages of Captain Cook, and the three artists who illustrated them, Sydney Parkinson, Georg Forster, and William Ellis respectively. There was also Ferdinand Bauer who accompanied Robert Brown on Flinders's voyage to Australia between 1801 and 1805. The British Museum (Natural History) possesses a fine collection of the drawings of Ferdinand Bauer, and also of his elder brother Francis, who came to England from Austria in 1788, and who settled soon after at Kew, where he remained for thirty years in the employment of Sir Joseph Banks as botanical draughtsman. The work of the brothers Bauer is of the very finest quality.

The influence of new discoveries is also apparent in illustrated books on insects, and although the first book exclusively devoted to entomology was Aldrovandi's *De Animalibus Insectis*, published at Bologna in 1602, an entirely new kind of insect-book came out at Amsterdam in 1705. This was Maria Sibylla Merian's *Surinamische Insekten*, the work of a remarkable woman who came of a family of Frankfurt painters.

In England, the productions of Moses Harris (*c.* 1730–1785) are among the finest illustrated entomological works of the period. His principal work was entitled the *Aurelian*, and formerly entomologists were called " Aurelians ".

There were many botanical artists of renown in England during the second half of the eighteenth century, and among these were Francis Masson [1741–1805], who was sent out from Kew Gardens to South Africa and elsewhere, and Frederick Polydore Nodder, who was employed by Sir Joseph Banks to make finished drawings of Parkinson's sketches of the plants collected on Cook's first voyage. In 1788 Nodder was styled " Botanical Painter to the Queen ".

Finally, there is a naturalist of real note, George Edwards, an Essex man, born in 1694. His great achievement was his *Natural History of Birds*, and his *Gleanings of Natural History*, published between 1758 and 1764. In these books nearly 600 species were illustrated for the first time. Swainson says of Edwards that he was " an unscientific but very accurate describer and painter of animals ", adding that " he had the simplicity and piety of Izaac Walton, and may be looked upon as one of our greatest worthies."

* * *

COUNCIL MEETING

A Council Meeting was held on 14th March, 1960, in the Council Room, Zoological Society of London.

* * *

The President's Medal

The President's Medal was instituted in 1955 to enable the Council to confer conspicuous honour on those members whom it might from time to time consider deserving of special honour at the hands of the Society.

The award has now been made to :—

Miss Phyllis Barclay-Smith in appreciation of her having edited the Avicultural Magazine continuously for 21 years, including the very difficult war years, during which time a very high standard has been maintained.

Mr. A. A. Prestwich in recognition of outstanding services as Hon. Secretary and Treasurer of the Society, and in the cause of Aviculture generally.

* * *

The Knobel Award

A new Medal, to be known as The Knobel Award, has been instituted. It will be awarded from time to time, at the discretion of the Council, to members of the Society resident overseas, for breeding successes meriting special recognition.

The award has now been made to :—

Dr. Sten Bergman, of Sweden, for his success in breeding the King Bird of Paradise.

Mr. C. H. F. af Enehjelm, of Finland, for his success in breeding many species under very difficult climatic conditions.

* * *

The Society's Medal

The Society's Medal has been awarded to Mr. Denby Collins, for breeding the Rameron Pigeon (*Columba arquatrix*).

Arthur A. Prestwich,
Hon. Secretary.

LONDON ZOO NOTES

By J. J. YEALLAND

Two young Black-necked Storks (*Xenorhynchus a. asiaticus*), the first to be exhibited at Regent's Park since 1941, have been purchased. There are, of course, two races of this handsome species, the nominate one ranging from India to Indo-China and southward as far as Ceylon and the Malay Peninsula and the other (*X. a. australis*) inhabiting New Guinea, islands in the Torres Straits, northern and eastern Australia, where it is sometimes known as the Jabiru. It is a bird of the swamps, creeks, and lagoons, living on fish and other water life and, it is said, carrion.

Other arrivals include a Knot (found with a wing injury), two Guillemots (found on the south coast covered in oil), an Abyssinian Lovebird, an Alexandrine Parrakeet, two Nonpareil or Painted Buntings, and a Black-headed Sugar Bird.

In one of three nests in the trees of the Southern Aviary is a young and vociferous Cormorant; another Black-footed Penguin has left the nest and one Cereopsis gosling has been hatched. Woodford's and Spotted Eagle-Owl have laid.

* * *

NEWS AND VIEWS

The Bronze Medal of the Avicultural Society of South Australia has been awarded to I. J. Boaden, for breeding the White-plumed Honey-eater.

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Possibly the most photographed bird in the world "Pierrot", the Peacock at the Palais des Nations, Geneva, has died. He was recently found frozen to death in his twenty-seventh year.

* * *

Walther Langberg, Copenhagen, writes concerning his Grey Parrots: "I have to date bred six young ones which are all still alive: 1956, two; 1957, two; 1958, two, both died; 1959, two, still in the nest-box."

* * *

F. E. B. Johnson reports: "My breeding season last year was not very successful and the final results were: Temminck's Tragopan, two; Elliot's Pheasant, seven; Swinhoe's Pheasant, ten; Amherst

Pheasant, eighteen ; and a number of Reeves' and partial albino Common Pheasants. The Tragopans stopped laying earlier than usual, due either to the very hot weather or the noise of the construction of the M.1."

* * *

The Adelaide Zoo reports that in February, 1957, they received four immature Mute Swans from the Perth Zoo. They eventually proved to be three males and one female. In September, 1959, a pair nested : four eggs were laid, and two cygnets were hatched during the first week of November. This event is particularly gratifying as it is apparently the first time the Mute Swan has been bred during the long history of the Zoo.

* * *

Sir Crawford McCullagh, Bart., sends his breeding results for 1959 : Splendid, seventeen ; Elegant, three ; Blue-winged, three ; Princess of Wales', one ; Barraband's, two ; Rock Pebbler, seven ; Pennant's, four ; Yellow-rumped, six ; Bauer's, three ; Stanley, four ; Many-coloured, four ; Red-rumped, eleven (eight yellow, three normal) ; Alexandrine, one ; Ring-necked, lutino, three ; Layard's, three ; Nyasa Lovebird, nine ; Chinese Painted Quail, two ; American Wigeon, four ; European Wigeon, seven ; Cinnamon Teal, two ; and Ring-necked Pheasant, four.

* * *

There has been considerable speculation amongst bird-watchers in West Cornwall, Connecticut, by the appearance of an European Robin. It now seems quite possible that it is a survivor of twelve originally imported from Belgium by Mr. H. Van Alen, of Newport, Rhode Island, in the spring of 1958. Eight were liberated in Rhode Island, Washington, and Maryland, in an attempt to establish the species in North America. It is now hoped to repeat the experiment on a larger scale.

* * *

Lloyd B. Thompson, British Columbia, writes : " My Turquoisines have produced a number of variations. In 1958 a hen was reared with red on the belly ; also birds with yellow on the head. Last year a hen was reared that appeared to have a blue cast over the breast and body, and there was far more blue on the head than is normal on a young one. This was a late hatched bird and she is moulting quite heavily now. Last year too, one pair had a young one that had very light down, but it died when only a few days old. Are these variations common in Turquoisines ? "

It is not often that items concerning British birds appear under this heading, but an event reported from the Firestone factory, on the Great West Road, appears to merit inclusion. Each year the factory is dressed for Christmas with elaborate illuminated displays, which this year included six 35 ft. Christmas trees, each lighted with 350 coloured lamps. The trees were erected and illuminated on 29th November and taken down on Twelfth Night. During the six weeks of the Christmas period all lighting was on night and day without a break. When the trees were taken down, a Blackbird's nest, with three eggs, was found in the upper branches of one. Two of the eggs were unfortunately broken when the tree came down, but the third has been kept by the Company as a memento of the event.

A. A. P.

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REVIEWS

THE WATERFOWL OF THE WORLD. Volume III. By JEAN DELACOUR, illustrated by PETER SCOTT. Country Life, London, 1959. Price £6 6*s*. net.

The third volume of this important work deals with the Eiders (*Somateriini*), Pochards (*Aythyini*), Perching Ducks (*Cairinini*), the Scoters, Golden-eyes and Mergansers (*Mergini*), and the Stiff-tailed Ducks (*Oxyurnini*), and completes the survey of all the known species of the Anatidae of the world. The author and artist are to be congratulated on this truly monumental contribution to ornithological literature which is of the greatest value to all those interested in this group of birds. To readers of the AVICULTURAL MAGAZINE the sections on aviculture will be of especial help and many quotations are made from previous numbers of the Magazine.

In the introduction it is stated that it had been previously planned to incorporate in the third volume some general chapters on the morphology, anatomy, and biology of the family; on history, sport, conservation, care and breeding; and also a bibliography, but it was found that this would entail so much work and take so much space that it was preferable to plan them for a fourth volume. It is satisfactory to note that it is hoped that this volume will be ready in the near future and will contain a number of interesting illustrations.

P. B-S.

THE BUZZARD. By FRANK WENZEL. George Allen and Unwin, Ltd. London, 1959. Price 35*s.* net.

This is a close and intimate study of the Buzzard, profusely illustrated by really superb photographs—some in black and white some in colour—the quality of both mediums reaching a very high standard. The author photographed his first Buzzard's nest at the age of fourteen and since that time examined well over 100 nests. His description of the behaviour of parents and of young at the nest is most informative and valuable, and there is no doubt that he knows a very great deal about this magnificent bird. This knowledge he imparts in a charming and graphic style which makes one almost smell the damp of the forests and see the rising mist over the lake. This is a book written by a true naturalist who is also a great artist, for not only are his photographs intensely interesting and depicting every aspect of the life of the Buzzard, but they are delightful to look upon as pictures. The text is beautifully translated from the Danish by Reginald Spink who undoubtedly has that rare gift of maintaining the style and spirit of the author.

P. B-S.

* * *

CORRESPONDENCE

SEXING LEADBEATER'S COCKATOOS

I was very interested in Dr. Kendall's notes on his cockatoos, and fully appreciate his difficulty in sexing Leadbeater's.

We have now reached the fifth generation of aviary-bred Leadbeater's, and during that time have had a number of good breeding pairs. With one of these, there never was any difficulty in sexing the young from the moment they left the nest. Cocks always had a black iris, which could just be discerned from the pupil when a strong light (such as the setting sun) was shining straight into it ; hens all had much lighter irises, some were almost red, some were a yellowish-hazel, but they were always easily distinguished. This was the first pair which reared with us and we thought it was quite simple to sex from the nest by the eye.

Later on, however, we had other unrelated pairs, in which the young all left the nest with dark eyes and the colour changed later. Sometimes this change took place a few weeks after fledging, and at others it took almost a year to become apparent. To complicate matters still more, we had two instances where a bird had one light eye and one dark, consequently one would sex the young one day in the aviary as two hens and one cock, then later on, one would decide that there were two cocks and one hen.

I have never had a young cockatoo which left the nest with a light iris which subsequently became dark, quoted by Dr. Kendall as being experienced by Miss Diekmann, and in this respect I certainly concur with Dr. Kendall.

E. N. T. VANE.

FAIRACRE,
BALLINGER,
GREAT MISSENDEN, BUCKS.

WING-PATCHES IN HEN SLATEY-HEADED PARRAKEETS

The differences between the plumage of the two Slatey-headed Parrakeets have been well described by K. Z. Husain in *The Ibis* (Vol. 101, pp. 249–250) and the very obvious differences are that in *P. h. himalayana* the green parts are much darker and that the central tail-feathers are on average more than twice as wide (11 mm. against 5 mm.).

P. h. finschi is of a much more yellowish-green and the tail, in addition to being narrower is longer. Females are said not to show the small maroon-coloured patch on the wing and the tail is considerably shorter.

It is, surely, the former that is sometimes known as Hodgson's Parrakeet, for it was named *Palaeornis schisticeps* by Hodgson in 1836, though Lesson had, of course, named it *Psittacus* (*Conurus*) *himalayanus* in 1832.

Tavistock called *finschi* Finsch's Parrakeet, but it is more generally known as the Burmese Slatey-headed Parrakeet, though, of course, it ranges far beyond the forests of Burma.

There is a muddle over the Plum-headed, Blossom-headed, and Rosy-headed Parrakeets. Seth-Smith (*Parrakeets*, 1910) calls *cyanocephala* the Blossom-headed and *rosa* the Rosy-headed : Tavistock (*Parrots and Parrot-like Birds*) calls them Plum-headed and Blossom-headed respectively. Biswas (*American Museum Novitates*, 1950), as I understand it, considers that what some of us have always called the Rosy-headed is a separate species and names it *Psittacula roseata* (consisting of two races) and *P. cyanocephala* a species of three races. However, it would surely be best to call the *rosa* (or *roseata*) the Rosy-headed because that is quite a good description and the more purplish-headed *cyanocephala* the Plum-headed because the colour of the head is much like that of a ripe plum. Incidentally, the hen Rosy-headed shows the small maroon patch on the wing which the hen Plum-headed does not, and that, one would think, is an additional reason for considering them separate species.

J. J. Yealland.

Zoological Society of London,
Regent's Park, London, N.W. 1.

My reply to Mr. Boosey's query was given under the impression that his problem was one of sex, not of racial distinction, for there is no doubt over the latter point.

The two races *Psittacula himalayana himalayana* and *P.h. finschii* can be distinguished at sight in either sex by the two central rectrices. In the nominate form these two feathers are broad along their entire length (about half an inch) whereas in *finschii* they taper rapidly to a width of between one-eighth to one-quarter of an inch with a somewhat spatulate tip. That characteristic alone enables them to be separated without difficulty. Naturally, the yellow tip of the broader tail looks much more pronounced. Descriptions of the two forms refer to more yellowish-green, more golden-yellow of the back, as well as more bluish slatey-black of the head in *finschii*, but these differences can only be noticed when comparing specimens side by side, and undoubtedly vary in individuals. The tail is generally bluer on the basal half in *himalayana*, and a mauve-lilac in *finschii*, but there is never any need to look beyond the width of the tail-feathers to determine the difference.

Although I have not yet had the opportunity to go into this matter very deeply, I have ascertained that no reference to this species has been made in the *Zoological Record* over the last twenty-five years (i.e. since Peters' Checklist), but I have inspected the very good series in the British Museum. These have been secured from five geographic areas :

1. Punjab and Kashmir—(*himalayana*)—7 hens, 13 cocks.
2. Kumaon, United Provinces—(*himalayana*)—2 hens, 10 cocks.
3. Nepal—(*himalayana*)—3 hens, 9 cocks.
4. Burma (except Tenasserim)—(*finschii*)—4 hens, 10 cocks.
5. Yunan, Annam, and Laos—(*finschii*)—10 hens, 10 cocks.

Apart from these specimens which are clearly sexed on the data labels, there are quite a number more without this information, as well as several immature specimens almost entirely green, or with the adult plumage only partially assumed.

Of the twenty-six hens and fifty-two cocks listed above, which appear to be definitely sexed by the collectors and also in adult plumage, only two hens have wing patches, one from group 4 and one from group 5. Conversely two cocks (so labelled) from group 5 had no wing patches.

Not only does this confirm the information supplied by Mr. Macdonald, but it emphasizes his remark : " If the specimens are correctly sexed, at least some females do have this feature." Further, it suggests that this characteristic varies in individuals, and is not a safe sexual distinction, at least in the eastern race. Sometimes hens may have it, occasionally too, cocks may not. That is assuming they have been correctly sexed by the collectors. Some of these examples had labels also written in eastern characters, indicating that they had probably been acquired by purchase from native sources.

This may be a point that aviculture can help to solve ; but even so, it would not necessarily follow that progeny reared in captivity, would constantly inherit a characteristic that had been evolved through generations in a geographic race due to ecological environment.

E. N. T. VANE.

FAIRACRE,
BALLINGER,
GREAT MISSENDEN, BUCKS.

FLIGHTLESS *DROSOPHILA* AND THE " LESSER MEALWORM "

The flightless mutant of the fruit-fly has been propagated in the London Zoo and used for the feeding of various invertebrates, small reptiles, and sometimes for birds. The culture medium consists of oatmeal, molasses, agar, Nipagin M, and yeast mixed with water and boiled. The resulting porridge is put into small milk bottles and each " boiling " can be used twice.

I have heard of a beetle that breeds in the deep layer of sawdust on the floor of a " broiler " house, the larva of which is called the " lesser mealworm." This presumably feeds on the dry mash provided for the poultry and it is said to breed so rapidly as to be a nuisance. Some specimens have been promised and if they materialize I will report on them.

J. J. YEALLAND.

ZOOLOGICAL SOCIETY OF LONDON,
REGENT'S PARK, LONDON, N.W. 1.

GENERIC NAME OF HANGING PARROT

The successful rearing of a Hanging Parrot, although a hybrid, at Chester Zoo is a most encouraging and commendable achievement, which may well persuade others to repeat the performance.

I should like to congratulate and thank those responsible, not only for accomplishing the feat, but also recording it with such helpful information for other aviculturists to follow.

I would, however, point out that the correct scientific name for the genus is *Loriculus*, Blyth, not *Coryllis*.

E. N. T. VANE.

FAIRACRE,
BALLINGER,
GREAT MISSENDEN, BUCKS.

STRANGE BEHAVIOUR OF COCK BULLFINCH

We have at Keston a cock Bullfinch—a tame one—whose behaviour in an aviary is so extraordinary that I think it is worth recording. It apparently has a hatred of cock pheasants, and although probably few people would believe that a Bullfinch could cause the death of a pheasant, yet it is true in the case of this bird ; or would have been, had we not intervened.

The cock Bullfinch and his hen first shared a large planted aviary with, among other birds, a trio of Golden Pheasants. The Bullfinch proceeded to conduct a war of nerves against the cock pheasant which consisted of constantly flying just an inch or so above its head wherever it went, until the poor bird was driven nearly mad. It would rush about trying frantically to escape from its small but relentless pursuer until, unable to do so, it was forced to take refuge in the thickest bush in the aviary : and there it had to stay, because the moment it ventured forth the Bullfinch began tormenting it again. Finally the pheasant, unable even to come out to feed, was rapidly going into a decline and would certainly have died had not either it or the Bullfinch been removed.

Since then we have tried the Bullfinch with Amherst Pheasants, but again it had to be removed, as it persecuted the cock in exactly the same way.

EDWARD J. BOOSEY.

BRAMBLETYE,
KESTON, KENT.

THE AVICULTURAL SOCIETY RECEIPTS AND PAYMENTS ACCOUNT

Year ended 31st December, 1959.

RECEIPTS

	£	s.	d.	£	s.	d.
To Balance at Bank, 1st January, 1959				377	11	3
„ Subscriptions						
Arrears	4	1	4			
Current	1,017	9	7			
In advance	174	4	6			
Life	75	0	0			
				1,270	15	5
„ Donations				45	17	10
„ Sales of Magazines				127	1	10
„ Sales of *The Anatinae*				4	8	0
„ Sales of *Grebes*				1	1	4
„ Sales of surplus books				229	3	9
„ Sales of waterfowl rings				12	4	6
„ Sales of coloured plates				31	16	6
„ Advertisements				243	17	1
„ Dividends				67	12	8
„ Miscellaneous receipts				8	19	3
				£2,420	9	5

PAYMENTS

	£	s.	d.
By Printing of Magazine	1,327	0	0
„ Coloured plates	315	12	8
„ Authors' separates	12	13	6
„ Sundry printing and stationery	69	2	3
„ Printer's service charges	16	8	6
„ Honorarium to Editor	100	0	0
„ Translations and services	7	7	0
„ Secretarial	52	0	0
„ Preparation of Index	15	15	0
„ Newman Library insurance	2	5	0
„ Advertisements, leaflets, etc.	26	14	5
„ Expenses at Council Meetings	6	12	0
„ Medals and engraving	31	5	6
„ Purchase of Magazines	1	10	0
„ Postages	43	5	4
„ Bank charges and cheque books	10	15	7
„ Miscellaneous expenditure	23	2	6
	2,061	9	3
„ Balance at Bank, 31st December, 1959	359	0	2
	£2,420	9	5

I have examined the above Account with the books and vouchers of the Society and certify it to be in accordance therewith. I have verified the Bank Balance.

LONDON.
31st January, 1960.

J. WATKIN RICHARDS, *Certified Accountant.* } *Hon. Auditor.*

CANDIDATES FOR ELECTION

T. Atkins, 32 Arundel Gardens, Westcliff-on-Sea, Essex. Proposed by A. A. Prestwich.

P. S. Bates, "Dunston," 80 Great Northern Road, Dunstable, Beds. Proposed by P. H. Maxwell.

R. D. Buckingham, Johnston, Iowa, U.S.A. Proposed by Miss K. Bonner.

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T. Hooley, 11 Coulsdon Rise, Coulsdon, Surrey. Proposed by W. J. Bourne.

R. H. Jarvis, Harveydale Farm, P.O. Box 1547, Salisbury, Southern Rhodesia. Proposed by O. E. Clements.

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Professor Carl Naether, 16759 Otsego Street, Encino, Calif., U.S.A.

Captain B. Hamilton Scott, Drayton, Foxhall Road, Rushmere St. Andrew, Ipswich.

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NEW MEMBERS

The sixteen Candidates for Election in the November–December, 1959, number of the AVICULTURAL MAGAZINE were duly elected members of the Society.

CHANGES OF ADDRESS

K. F. CLARKE, to Charlecote Farm House, Charlecote, Nr. Warwick.
H. W. H. OZANNE, to Le Mouillage, Rue de la Grande Maison, St. Peter in the Wood, Guernsey.

DONATIONS

(Coloured Plate Fund)

	£	s.	d.
Mrs. J. Dalziel Birrell	5	0	0
J. Spedan Lewis	5	0	0
Mr. and Mrs. "Alpha"	4	4	0
Lady Poltimore	3	0	0
H. Cowley	2	3	0
S. Murray	2	0	0
Griswold Frelinghuysen	1	15	0
Joshua Z. Howell		15	0
T. V. F. Papé		15	0
F. J. Burt		10	0
A. G. Thomas		10	0

MEMBERS' ADVERTISEMENTS

The charge for Members' advertisements is THREEPENCE PER WORD. *Payment must accompany the advertisement, which must be sent on or before the 15th of the month to* A. A. PRESTWICH, 61 CHASE ROAD, OAKWOOD, N. 14. *All members of the Society are entitled to use this collumn, but the Council reserves the right to refuse any advertisements they consider unsuitable.*

FOR SALE

For Indian birds buy direct from K. L. ACOOLI AND SONS, Post Box 12008, Calcutta 2, India.

From outdoor flights: 2 Senegal Parrots, £7; 2 Brown-eared Conures, £6. From indoor cages: 1 Golden-fronted Fruitsucker, £4; 1 Hangnest, £7; 2 Common Spreo Starlings, £3; 2 Peach-faced Lovebirds, £5; several blue Budgerigars, 10*s.* each. Preference given to callers:—Mrs. J. DALZIEL BIRRELL, Christmas Cottage, Wisborough Green, Sussex. Telephone: Wisborough Green 274.

In the Spring, 1960, there will be published *Pageantry of Tropical Birds*: this is a reproduction of Descourtilz's "Oiseaux Brillans" of Brazilian Birds (of which only one copy is known to exist). Thirty-two pages of text, thirty-two full-colour reproductions, twenty eight in black and white, size 12 × 17 inches, cloth-bound; prepublication price £11 15*s.* Order your copy from:—G. DE GOEDEREN, Orteliuskade 74, Amsterdam, Holland.

WANTED

Red-bellied Conure, guaranteed male:—E. FRYER, 58 Stroud Road, Gloucester.

Golden-fronted Parrakeet cock, Blossom-headed Parrakeet hen, true pair Moustache Parrakeets, also Hanging Parrots:—Mrs. J. DALZIEL BIRRELL, Christmas Cottage, Wisborough Green, Sussex. Telephone: Wisborough Green 274.

American desires contact with English Aviculturist or anyone coming to the U.S.A. who would consider personally escorting two rare birds. A fee of £30 is offered:—DAVID WEST, 209 N. 18th Street, Montebello, California, U.S.A.

STEPHEN AUSTIN AND SONS, LTD., PRINTERS, HERTFORD.